

The Tyranny of Qwerty

BY CHARLES LEKBERG

How a hundred-year-old typing system can tangle your fingers and waste your time.

What can you say about a valuable, desperately needed skill that:

- takes up to twice as long as it should to learn;
- takes up to twice as long as it should to use;
- makes you work perhaps twenty times harder than necessary;
- uses equipment booby-trapped to ensure errors;
- has persisted out of sheer inertia since 1872;
- is still being taught to millions of unsuspecting people?

Well, you can't say much.

The skill in question is typing, typing on qwerty. Qwerty—in case you've been using it for so long that you have forgotten what it is—is the name for the standard typewriter keyboard. Q, w, e, r, t, and y are the first six keys in the upper row of letters. Together they make up the traditional name for the keyboard. Qwerty even sounds faintly contemptible, and, after you learn the facts, it is.

Briefly, qwerty came about this way. The first commercially practical typewriter was put together in Milwaukee through the work of C. Latham Sholes, Carlos Glidden, Samuel Soule, James Densmore, Matthias Schwalbach, and a few others. Sholes and his associates began with a device to number the pages of a book and by 1867 created a rather crude machine that could make every man his own typesetter. This working model was first patented in 1868, went through many refinements, and was then turned over to E. Remington and Sons, gun makers, of Ilion, New York, for manufacture, in 1873.

In their innocence Sholes and his partners first arranged the letters of the typewriter's keyboard in alphabetical order, but the uselessness of this system soon became apparent. Also, that particular model had mechanical problems. Type was suspended by wires in a small, circular nest inside the machine. You didn't have to type very fast for the letters to rise up and jam at the platen (the roller of a typewriter), the very place where they were supposed to print.

To end that annoyance, James Densmore asked his son-in-law, a Pennsyl-

vania school superintendent (who surely should have known), what letters and combinations of letters appeared most often in the English language. Then, in 1872, Densmore and Sholes put what they believed to be the most used characters, as far apart as possible in the type basket and ended up with the horror of qwerty.

Since that time typewriters have become so refined mechanically that they almost operate themselves; the key-

two grants from the Carnegie Corporation, August Dvorak came forth with a new typewriter keyboard. It was a dream.

On this keyboard you could type more than 3,000 words on the familiar home row compared with perhaps only fifty on qwerty's home row. Dvorak put all the vowels in his home row, under the fingers of the left hand. The right hand rested atop h, t, n, and s, with d just to the left of the right index finger. Qwerty's j and k, occupying the most prominent place, were banished to just about the least prominent on Dvorak's keyboard. And so on.

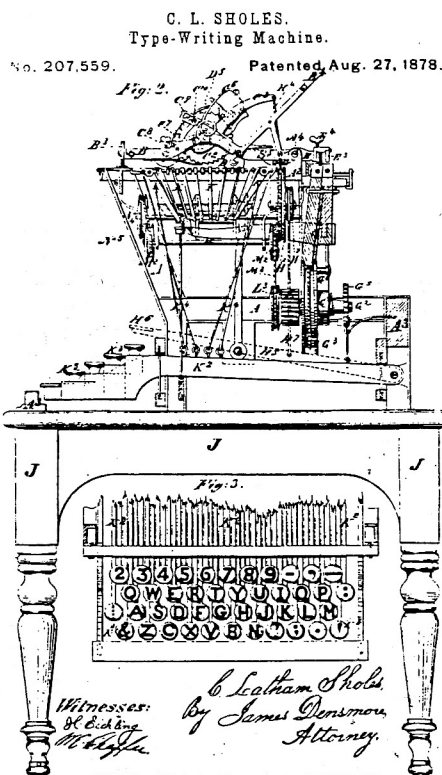
Dvorak rearranged things so that 70 per cent of the work could be done in the home row, 22 per cent in the row above, and 8 per cent below. Numbers remained at the top, though in a different lineup. With qwerty, 32 per cent of the work is done in the home row, 52 per cent above, and 16 per cent below.

Dvorak also made the right hand work harder, giving it 56 per cent of the load, the left hand 44 per cent. On qwerty, the left hand had to handle 57 per cent of the work, the right hand 43 per cent. Dvorak also straightened out the work load of the separate fingers and greatly reduced the clumsy stroking that almost guaranteed fatigue and errors.

In his 538-page book *Typewriter Behavior*, Dvorak, then professor of education and director of research at the University of Washington in Seattle, described his work. He had studied thousands of words to discover the frequency of letters and letter combinations. He scrutinized finger movements with slow-motion films of typists. And he tested more than 250 possible keyboards.

One of his early conclusions was that you could come up with a better keyboard simply by arranging the letters at random—a pretty strong condemnation of qwerty.

Dvorak, of course, was not the first, or the last, to try to improve the old Sholes keyboard. As far back as 1893, for example, J. G. Hammond came up with what he believed was a better arrangement. And in the 1940s Roy T. Griffith of Pittsburgh introduced his Mini-motion keyboard, which also allowed more words to be typed on the home



board designed in 1872, however, remains basically the same. Today you and I and about fifty million other people in the English-speaking world still use qwerty. Touch typing, in use almost from the very start, still has beginners thumping away, mumbling to themselves, "a, s, d, f, space . . . semicolon, l, k, j, space."

Will it last forever? It could, for all we typers seem to care. And yet for forty years—since 1932—a logical alternative has been available but almost totally ignored. The world has hardly beaten a path to his door, but in 1932, after twenty years of study financed by

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row. But Dvorak's arrangement seems to have been the best researched and, in the opinion of many, by far the best.

True, there was a certain flurry of interest when Dvorak came out with his keyboard, but no one could figure out how to change. Everybody—typists, industries, schools—was committed to another system.

Dvorak persisted. One of his most impressive demonstrations took place during World War II when he retrained fourteen navy women to use his keyboard. After a month the women were turning out 74 per cent more

work and were 68 per cent more accurate. After only ten days, in fact, the change had paid for itself.

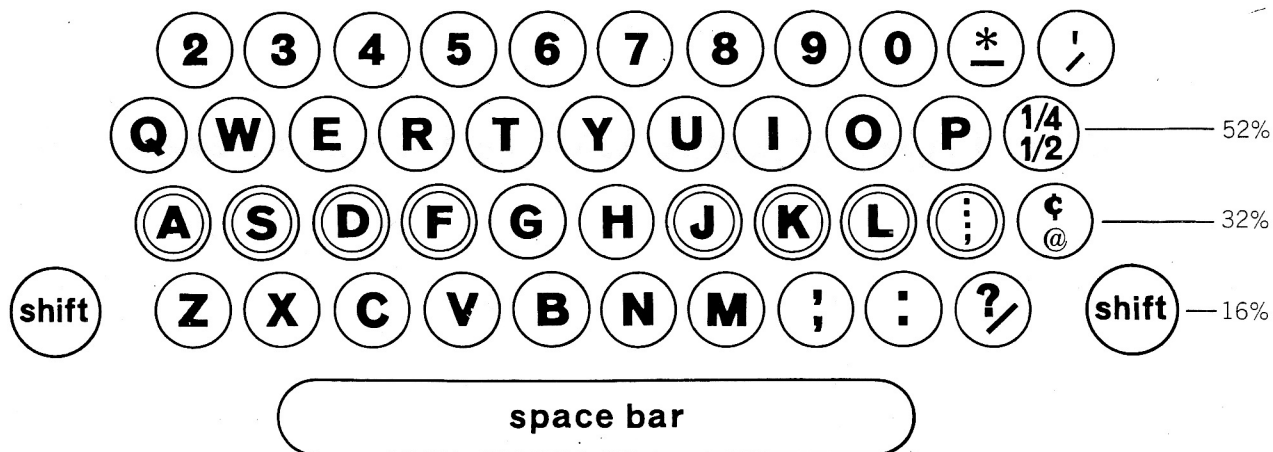
Using the Dvorak simplified keyboard, or DSK, as it came to be called, the women's fingertips were moving little more than one mile on an average day, compared with twelve to twenty miles a day for typists using the standard keyboard.

Test after test was conducted—so many in fact that by 1965 the U.S. Bureau of Standards felt compelled to say that "there is little need to demonstrate further the superiority of the Dvorak

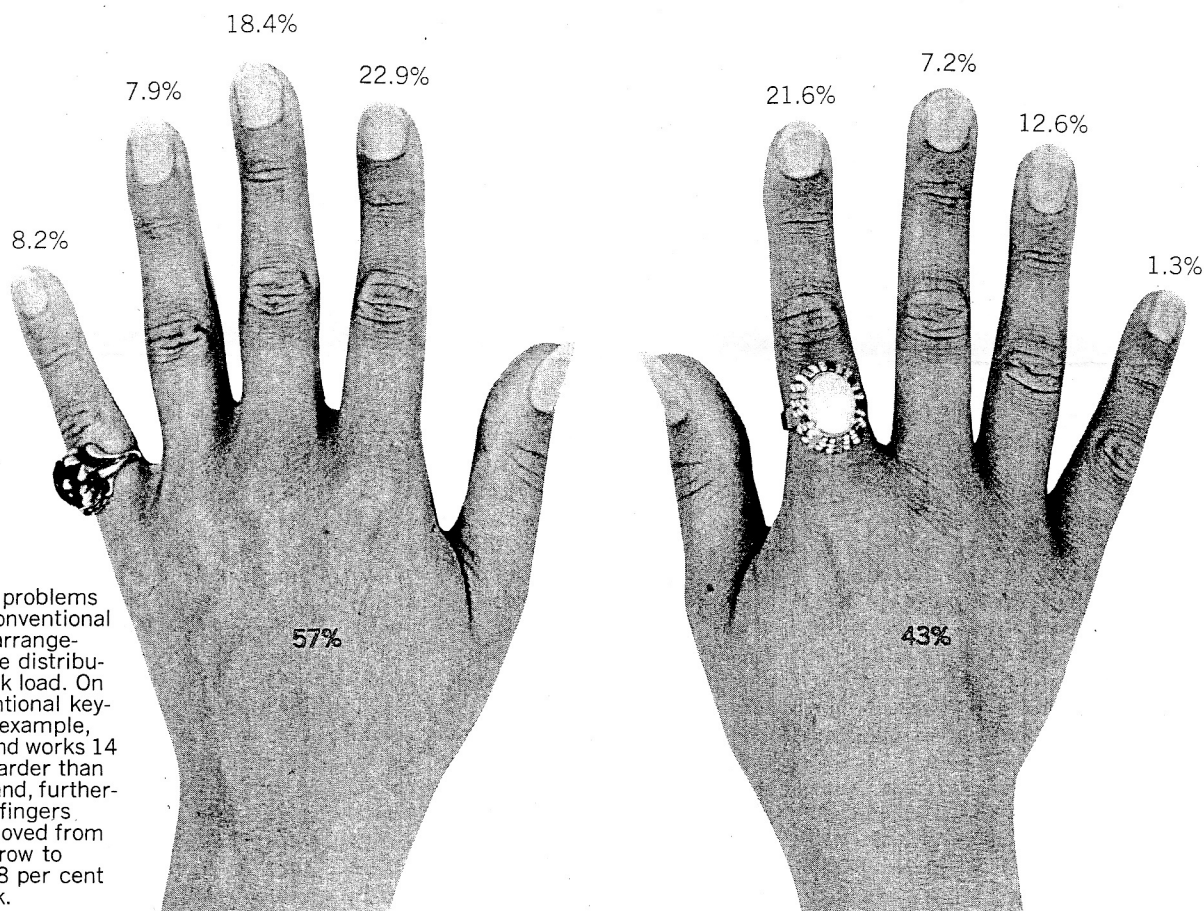
keyboard in experimental tests. Plenty of well-documented evidence exists."

Part of that evidence was accumulated during the 1940s, when typing competitions were the vogue. Between 1933 and 1941 DSK typists captured twenty-six international speed records, forty-five first places, and four grand championships.

The outstanding virtuoso on DSK was one of Dvorak's own pupils, Lenore Fenton MacClain, who won eight world records in typing and transcription. Mrs. MacClain typed 70 words a minute pre-DSK, then switched and



CONVENTIONAL KEYBOARD



One of the problems with the conventional keyboard arrangement is the distribution of work load. On the conventional keyboard, for example, the left hand works 14 per cent harder than the right, and, furthermore, the fingers must be moved from the home row to perform 68 per cent of the work.

reached a zippy 182 words a minute, net, in one unofficial test. A net score is computed by subtracting ten words typed for each error. You could say that Mrs. MacClain's achievement is unusual, and you would be right. But many DSK typists do double their former speeds and break the 100-word-a-minute barrier.

Looking at such results, Robert L. McCauley, a former computer man and now promoter of instructional literature for DSK, asks: "Is the DSK that good, or is the standard keyboard just that bad?" To these questions his answers

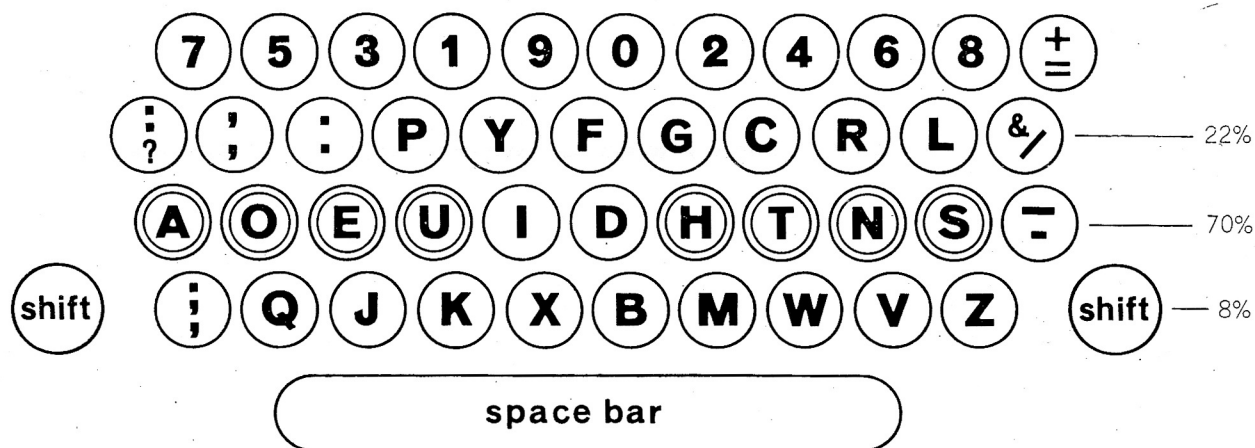
are "Yes!" and "Yes!" McCauley, now based in Burbank, California, turned to DSK a few years ago. He maintains that:

- anyone, including children, can begin to master DSK in less than two weeks;
- speeds of forty to fifty words a minute can be attained in two to three months;
- superspeeds of more than 100 words a minute are possible for many in less than a year;
- fatigue and mistakes are greatly lessened.

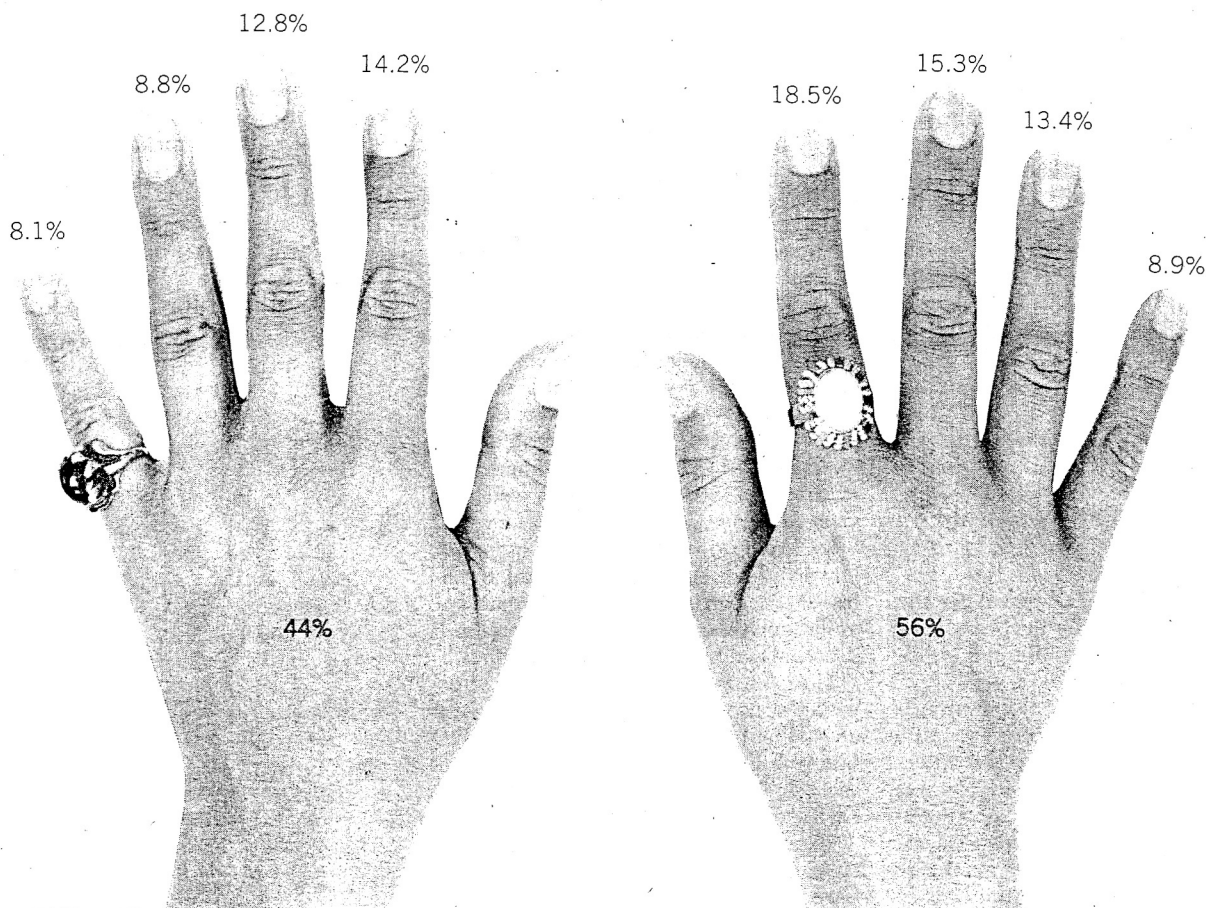
But McCauley doesn't believe DSK is for everyone, even though it is obviously hands-down superior. Like power steering and automatic transmissions for automobiles, it should, he feels, be available for those who want it. He believes the "let's-all-change-to-DSK" talk turns a lot of people off and is actually slowing down acceptance of a new keyboard.

Such fears, however, don't seem to bother the other main advocate of DSK, Philip Davis of Irvington, New Jersey.

Davis, a journeyman printer and for-



DVORAK SIMPLIFIED KEYBOARD



mer teacher, became seriously interested in DSK in 1964 and now heads a company that offers typewriters with the new keyboard. (Davis recently delivered a DSK typewriter to Ralph Nader at the Center for Auto Safety in Washington, D.C. Interestingly, Nader requested a manual machine rather than an electric one. He believes, it seems, that electric typewriters add to the nation's energy crisis.)

Davis wants DSK adopted by individual typists and, especially, by the printing industry for its composing machines, many of which are now the so-called cold-type perforators that use qwerty instead of the old linotype keyboard, itself a special monster. A perforator is a sort of minicomputer with typewriter keyboard that produces holes in a tape. After typing up a tape, the operator feeds it back into the machine and out comes column after column of justified type.

Unlike Bob McCauley, Davis looks for total conversion to DSK eventually. "But a switch to Dvorak keyboarding is not like changing the rules about which side of the street you drive on," he says, attacking what he calls the "clean-sweep" theory.

"The change can be made perfectly well," he says, "one person at a time, one operator at a time. Any office manager can rearrange work loads to fit his schedule."

According to Davis, "present-day typing classes fail to bring seventy per cent of the students up to a forty-word-a-minute competence. The Dvorak record, on the other hand, is virtually one hundred per cent successful in imparting sixty-word-a-minute excellence in about the same training time that would have led to thirty words a minute on old qwerty."

But couldn't computers come up with something even better than Dvorak, which was, after all, developed some forty years ago?

Davis doesn't think so. "Every newcomer thinks he'll get different and better answers if he rounds up new data and runs it through a computer," he says. "Dvorak took the utmost pains to get the ultimate keyboard. Of course, there are thousands of ways to arrange a typewriter keyboard. But few of these are even plausible, and all the plausible ones were analyzed down to the last detail. Dvorak is the outcome."

And how about the equipment problem?

Davis says: "For every alphanumerically keyboarded device, except most of the old models of linotype and intertype, there is some conversion method well within the range of economic practicability. An attachment to convert a rather wide variety of machines could be provided at about the cost of a good office-model typewriter. For the

flexible, more expensive electronic devices, not even this is required.

"You can make the change by attrition," he adds. "It takes about the same time to train an operator as it does to get equipment. The life of a typewriter in a big bank is eight years. Most office careers last longer than that. When the time comes to get a new machine, the time to retrain the operator has come, too."

Davis cites a two-year experiment (1966-1968) when DSK was tested in the composing room of the Western Publishing Company printing plant in Cambridge, Maryland. A woman employee was retrained for two full weeks on a DSK keyboard. Then she was put to work on a perforator.

The woman, previously the slowest operator in the plant, rose from 12,000 strokes an hour to 16,000, the plant record being 18,000. But then Western had a change in management, and that was about as far as it all went.

More recently Blaine Hiscock, head machinist at the Toronto *Globe and Mail*, trained two composing room operators on DSK. Hiscock reports: "We found we were able to move the two people involved to the perforating machines after about a month of practicing one to three hours a day on a DSK typewriter."

Hiscock emphasizes that the *Globe and Mail* doesn't have a concentrated training program for DSK perforation, but he says, "We would consider the results of our experimentation quite encouraging if we decided to expand with DSK."

He adds that he converted two of his own typewriters to DSK, one manual and one electric portable, by resoldering the type slugs to the type bars.

Suppose you want to introduce DSK in your home or office. Can you easily get the equipment and retrain yourself and your staff? The equipment is easy enough to get, as is the instructional material. And you can retrain yourself or others if you can spare the time or persuade people to relearn on machines that they will find almost nowhere else. It takes a minimum of six weeks to switch, preferably after you take a rest from qwerty. Unlike being bilingual, however, you can't be bidigital to the extent that you can switch from one multikeyed machine to another with a different setup.

How do you get a DSK? Any typewriter company will sell you one. Like any company, typewriter firms are first interested in profits—revolution comes second, if at all. So they don't push DSK.

Remington makes no additional charge for the keyboard if it is ordered with pica type. Smith-Corona Marchant makes a "slight additional

charge," depending on the model ordered. It adds that "the demand is increasing as people learn of the advantages of DSK."

Royal reveals that it sells "fewer than twenty-five machines a year" with DSK, adding that there is a fixed charge of \$20 extra for DSK and "all nonstandard keyboards."

IBM offers DSK on one model only, at an additional charge of \$40.

So there it is—perhaps the perfect keyboard. Supporters like Phil Davis believe the arrival of the computer will hasten its adoption. You talk to a computer by keyboard, he says, and it doesn't make much sense to use the 1872 arrangement to slow down a lightning-swift machine.

Others aren't so sure. They think electronics may find other ways of transferring information into machine language. Also, critics say, if Dvorak's keyboard were going to be adopted, it would have happened before this.

Still, it's hard for an observer to plow through all the history, consider all the facts, think of all the wasted time and effort and failure connected with qwerty, and then conclude that DSK is doomed. August Dvorak, now eighty years old and living in Seattle, certainly doesn't think so, even though his patent rights ran out in 1962 and he can no longer profit financially from his creation.

Inquiries about, and individual conversion to, DSK are constant even if adoption by industry and schools is not. As the years go by, in fact, DSK looks more and more like some sleeping beauty waiting for a handsome, efficiency-conscious prince to awaken her with a kiss. It may be a long, long time before the world stops thinking of "Humoresque" every time it hears the name Dvorak, but it can happen. There must, after all, be a better way for that silly, quick brown fox to jump over that lazy dog. □

